

REMARKS**Forms 892 and 1449A:**

Applicants respectfully request that the Examiner issue a Form 892 listing the Ahlrot patent. This patent was cited in the Office Action, but not listed on the accompanying Form 892.

Applicants further request that the Examiner send to the undersigned an initialed copy of the Form 1449A, which was submitted on October 30, 2003 with a Supplemental Information Disclosure Statement, indicating that the information has been considered and made of record herein.

Claims:

Claims 1-12, 19-29, 31-35 and 37-52 are pending. Claim 41 has been amended and claims 42-52 have been added. The colon at the end of claim 12 was changed to a period to conform with the original claim and correct an obvious typographical error in a prior response. The subject matter of claims 42-52 is supported in the disclosure, including the drawings. For example, the stretch fit feature recited in claims 43, 47 and 51 is described on page 3, lines 7-9 of the disclosure. The rejections set forth in the Office Action are addressed below.

Section 102:

Claims 1-3, 6, 19-21, 23, 24, 27-29, 31-35 and 37-41 were rejected under 35 U.S.C. §102(b) as being anticipated by Bille (U.S. Patent no. 1,608,197). Reconsideration and withdrawal of this rejection is requested.

Independent Claim 1:

Claim 1 recites:

A duct joining system, comprising:
a first duct having a male end;
a flexible seal and locking mechanism retained on said male end of said first duct; and
a second duct having a female end having a first cross sectional area and a first bead of a second cross sectional area that is greater than said first cross sectional area, whereby upon sliding said female end over

said male end to where said flexible seal and locking mechanism is aligned with said first bead, said flexible seal and locking mechanism expands into said first bead to form both a seal and a mechanical lock that provides resistance to the separation of said first duct and said second duct greater than a resistance to the joining of said first duct and said second duct.

Bille does not disclose anything remotely similar to Applicants' first and second ducts and flexible seal and locking mechanism, which are constructed and arranged as set forth in Applicants' claim 1, whereby upon sliding one duct end over the other duct end to where the flexible seal and locking mechanism is aligned with the first bead, the flexible seal and locking mechanism expands into the first bead to form a seal and mechanical lock. Bille simply does not disclose or suggest anything remotely similar to such a structure that facilitates a seal and lock in response to sliding one duct over another.

Bille discloses "driving" a malleable ring between two pipes after one pipe is inserted into the other. Further, Bille's ring does not expand, nor is it capable of expanding into a bead in the outer pipe upon sliding the outer pipe over the inner pipe as set forth in Applicants' claim 1. In fact, the drawings suggest that if Bille's ring were on the end of the inner pipe before sliding the outer pipe thereover, the outer pipe would push the ring away. This problem would be exacerbated in the embodiment shown in Bille's figure 2, where the female end includes inwardly projecting bead 17. Bead 17 would preclude the ring from ever being aligned with the recessed part 16 of pipe 14. Furthermore, Bille's pipes 6 and 8 do not have an end having a first cross sectional area and a bead of a second cross sectional area greater than the first cross sectional area as set forth in claim 1.

Bille also does not disclose that a lock or seal is formed when the ring is "driven" between overlapping pipes. Bille's structure requires another step to deform the ring and urge portions thereof against the pipe. That is, after Bille "drives" the ring between the pipes, Bille applies caulking to upset the ring's central portion 1 and urge the ring's wings 2 and 3 against the walls of the pipes. Even after the ring is "driven" between the pipes and the caulking applied, Bille does not disclose that the caulking necessarily results in a seal and lock that provides a separation resistance that is at least three times greater than the joining resistance as set forth in Applicants' claim 3.

In sum, Applicants' claimed structure facilitates one-step duct coupling as compared to Bille's joint structure, which requires three-steps to couple two pipes. Bille (1) overlaps two pipes, (2) drives a ring therebetween and (3) applies caulk to upset the ring and compress portions thereof against the pipes. Bille lacks any disclosure of an apparatus having first and second ducts and a flexible seal and locking mechanism constructed and arranged as set forth in claim 1, whereby upon sliding the female end of the second duct, which has a bead, over the male end of the first duct to where a flexible seal and locking mechanism is aligned with the bead, the flexible seal and locking mechanism expands into the bead to form both a seal and mechanical lock.

Independent Claim 19:

Claim 19 claims means for providing a seal and a mechanical connection between a first duct and a second duct when a portion of the first duct is inserted into a portion of the second duct. Means plus function language must be interpreted in accordance with 35 U.S.C. §112(6). *In re Donaldson Co.*, 16 F.3d 1189, 1193, 29 USPQ 2d 1845, 1848-49. The Federal Circuit en banc stated that the PTO must look to the specification and interpret that language in light of the corresponding structure, material or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. *Id.* Applicants' corresponding structure in the specification for the "means for providing a seal and a mechanical connection" does not require driving a ring between two pipes nor does it include caulking as does the connection means in Bille. Accordingly, Bille does not anticipate this claim.

Independent Claim 27:

Claim 27 recites:

A duct joining system comprising:
a first duct including a member disposed on an exterior surface of said first duct about a cross-section thereof; and
a second duct including a groove extending outward from an interior surface of said second duct about a cross-section thereof, whereby upon sliding said second duct over said first duct until said member is in said groove a seal and a resistance to a separation of said first duct and said second duct greater than a resistance to the insertion of said first duct into said second duct is provided by said member and said groove.

Bille does not disclose such a structure whereby upon sliding a second duct over a first duct until the member is in the groove, a seal and resistance to separation is provided. Bille overlaps two pipes, drives a ring therebetween and applies caulk to upset ring and compress portions thereof against the pipes.

Independent Claim 32:

Claim 32 recites:

A duct joining system comprising:

a first duct including a member on an exterior surface thereof, said member having a height from said exterior surface; and

a second duct including a groove extending outward from an internal surface thereof, said groove having a depth from an interior surface thereof, wherein the depth of the groove and the height of the member are selected so that upon sliding said second duct over said first duct until said member is in said groove, a seal and a resistance to a separation of said first duct and said second duct greater than a resistance to the insertion of said first duct and said second duct is provided by said member and said groove.

Bille's ring is not positioned in such a groove in a second duct, whereby upon sliding one pipe over the other until the member is in the groove, a seal and resistance to separation is provided. Bille overlaps two pipes, drives a ring therebetween and applies caulk to upset ring and compress portions thereof against the pipes.

Independent claim 39:

Claim 39 recites:

A duct joining system comprising:

a first duct;

a member on an exterior surface of said first duct; and

a second duct including a groove extending outward from an internal surface thereof, wherein said groove and member are configured to form a seal and a resistance to separation of said first and second ducts greater than a resistance to the insertion of said first duct and said second duct upon insertion of said first duct into said second duct to a position where said member is in said groove.

Bille does not provide such a groove and member configured to form a seal and a resistance to separation of first and second ducts greater than a resistance to the insertion of the first duct into the second duct upon insertion of the first duct into the second duct to a position where the member is in the groove.

Independent claim 41:

Bille also does not anticipate claim 41. First, Bille does not disclose first and second ducts each of which have an annular recess. Neither pipe 7 (Fig. 1) nor pipe 18 is shown with such recesses.

Bille also does not disclose a duct joining system having assembled and unassembled states as set forth in the claim. For example, Bille does not disclose or suggest a duct joining system where one of two ducts to be joined has an annular recess and a flexible seal disposed therein when in an unassembled state. The Examiner, however, advanced that claim 41 is a product-by-process claim and gave this structure "little patentable weight." Applicants respectfully submit that the product-by-process claim characterization is improper and that the structure be fully considered.

Product-by-process claims define a composition or matter or article in terms of how the article is made, rather than in terms of the structure of the article. The Examiner has not pointed to any process limitation that would convert this claim to a product-by-process claim.

Claim 41 describes a duct joining system in terms of its structure in both its assembled and unassembled states to claim operatively associated elements of the system. There is no basis set forth in the Office Action for the product-by-process characterization. Accordingly, the assertion that Bille need not disclose the unassembled state structure set forth in claim 41, where the flexible seal is disposed in the annular recess of the first duct, and the corresponding rejection should be withdrawn.

The remaining claims, which depend from one of the independent claims discussed above, are allowable for reasons provided above as well as for containing subject matter not disclosed or suggested in the cited references. For example, Bille's ring is not held "at an angle relative to normal and away from the end of the first duct" as set forth in Applicant's dependant claims 2 and Bille's ring is not carried by the first duct prior to insertion of the first duct into the

second duct as in Applicants' dependent claim 38.

Section 103:

Claims 4, 5, 7-12, 22, 25 and 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bill in view of Ahlrot (U.S. Patent no. 3,955,834).

Independent Claim 7:

Claim 7 recites:

A duct joining system comprising:
a first duct having a female end;
a flexible seal and locking mechanism retained within said female end of said first duct; and
a second duct having a male end having a first cross sectional area and a first bead of a second cross sectional area that is less than said first cross sectional area, whereby upon sliding said female end over said male end to where said flexible seal and locking mechanism is aligned with said first bead, said flexible seal and locking mechanism expands into said first bead to form both a seal and a mechanical lock that provides resistance to the separation of said first duct and said second duct greater than a resistance to the joining of said first duct and said second duct.

The Examiner advanced that Bille discloses the claimed invention except for a second duct having a male end having a first cross sectional area and a first bead of a second cross sectional area that is less than the first cross sectional area. The Examiner further advanced that Ahlrot discloses a second duct (1) having a male end having a first cross sectional area (6d) and a first bead (1a) of a second cross sectional area that is less than the first cross sectional area to have an improved sealing arrangement (col. 1, lines 41-47) to conclude that it would have been obvious to provide Bille's second duct with a male end having a first cross sectional area and a first bead of a second cross sectional area that is less than the first cross sectional area.

Contrary to the Examiner's assertion, Bille does not disclose the claimed invention except for a second duct having a male end having a first cross sectional area and a first bead of a second cross sectional area that is less than the first cross sectional area as the Examiner suggests. Bille does not disclose or suggest apparatus including a first duct having a female end, a flexible seal retained within said female end and a second duct having a male end having a first

bead, whereby upon sliding the female end over the male end to where the flexible seal and locking mechanism is aligned with the first bead, the flexible seal and locking mechanism expands into the first bead to form both a seal and mechanical lock as set forth in Applicants' claim 7.

Further, there is no motivation in Bille or Ahlrot taken alone or in combination to modify Bille's male duct to have a male end having a first cross sectional area and a first bead of a second cross sectional area that is less than the first cross sectional area. The Examiner refers to the improved sealing arrangement described at column 1, lines 41-47 to advance that it would have been obvious to so modify Bille's inner duct to include a first cross sectional area corresponding to Ahlrot's cross sectional area 6d and a first bead corresponding to Ahlrot's bead 1a, but there is no suggestion in this section to carry out the proposed modification.

The improved sealing arrangement described at column 1, lines 41-47 concerns an L-shaped seal, which is secured around connector tube 1. There is nothing in this section that suggests that the different cross sections present in connector 1 at inset zone 1a and protruding central portion 6d provide the improved sealing, let alone how the substitution of Ahlrot's connector tube configuration for the configuration of Bille's inner tube would work with Bille's ring 1.

For example, although Ahlrot's inset zone 1a provides a surface upon which seal 2 rests, central portion 6d merely serves to separate inner guide portions 6b of connecting member 1 to maintain female ducts 4 separate. Not only is there no motivation or reason founded in Ahlrot to provide Bille with such a protruding separation bead in Bille's inner duct, such a modification would render Bille inoperable. Specifically, a protrusion so placed in Bille's inner duct would interfere with the driving of ring 1 between Bille's ducts after one duct is inserted into the other in accordance with Bille's disclosure.

Similarly, the Examiner has not pointed to any motivation to incorporate second and third beads in Bille's inner duct as set forth in the rejection of Applicants' claims 4 and 5. The remaining claims, which depend from one of the independent claims discussed above, are allowable for reasons provided above as well as for containing subject matter not disclosed or suggested in the cited references.

If the Examiner maintains any of the foregoing rejections, Applicants request that the


Examiner clearly point to specific examples in the cited references that support any rejection so maintained. For example, if the Examiner maintains the product-by-process characterization of claim 41, Applicants request support for that characterization and a clarification of what "the system having...is given little patentable weight" means.

Applicants submit that the pending claims are now in condition for allowance and respectfully request the issuance of a formal Notice of Allowance at an early date. If a telephone interview would advance prosecution of the application, the Examiner is invited to telephone the undersigned at the number provided below.

In the unlikely event that the transmittal letter is separated from this document and/or the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due, including additional claims fees, in connection with the filing of this document to Deposit Account No. 50-1947 referencing Attorney Docket No. PEG-2001CP1.

Respectfully submitted,

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